



Intro to Forest Measurements

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Why Measure Trees?



- To calculate timber value.
- To learn how trees or whole stands are growing.
- To gather data about a particular tree. (Big tree candidates)
- To help with other management decisions.



Standard Measurements

- Age
- Height (total or merchantable)
- Diameter at breast height (DBH)
- Stand density (stocking)
- Basal area of stand
- Wood volume



Tools

- Increment borer – age, growth rate
- Biltmore stick – height, diameter, volume
- Clinometer – height, slope
- Prism – basal area
- Diameter tape – diameter



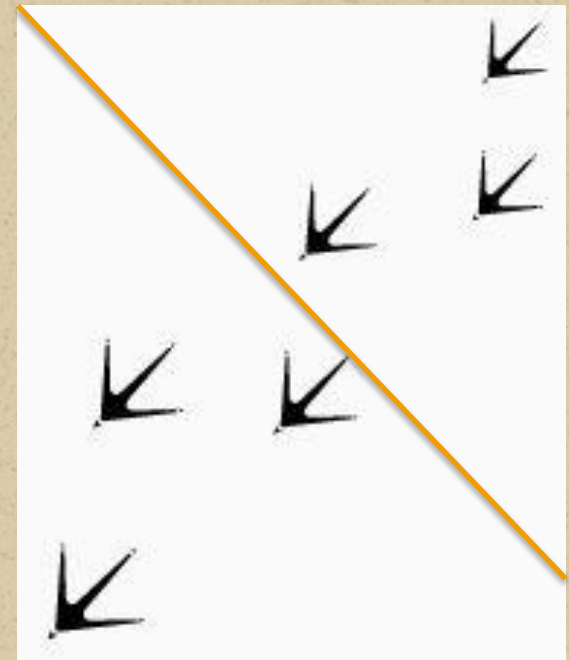
Pacing

- Provides a good estimate of distance, without using a measuring tape
- Varies for each individual
- Helpful to know how many paces make a chain (66 feet) – a common forestry measure



Pacing

- One pace (Right step, left step, right step)
When the right foot hits the ground again that is a pace.
- There are two paces divided by the orange line in the image.





Pacing

- Measure a defined distance, such as 66 feet (one chain).
- Walk that distance using your normal gait, counting every other step.
- Divide the distance walked by the number of paces.
 - ◆ Example: If it takes 13 paces to reach 66 feet, then one pace (2 steps) is a little more than 5 feet.



Biltmore Stick

- Several tools in one:
 - ◆ Biltmore stick (tree scale) to measure DBH
 - ◆ Log scale to measure cut log diameters
 - ◆ Merritt Hypsometer to measure height
 - ◆ Tables for calculating timber volume





Using a Biltmore Stick



■ Advantages:

- ◆ Inexpensive; easy to learn; lightweight; one tool does several tasks

■ Disadvantages:

- ◆ Not as precise; may not be practical over large areas



Using a Biltmore Stick to Determine Height

- This video explains how to determine height with a Biltmore Stick
- [Measuring Tree Height With a Scale Stick – YouTube](#)
- When doing to determine merchantable height remember to stop measuring at the first fork in the tree. Above this the tree is likely unsuitable for lumber.



Using a Biltmore Stick to Determine DBH

- This video shows how to use a Biltmore stick to determine the DBH of a tree.
- [Measuring tree diameter using a biltmore stick - YouTube](#)



Using a Biltmore Stick to Calculate Sawtimber Volume

- On the “tree scale” side of the stick, find the tree’s diameter along the top.
- Find the number of 16-foot logs in the left column.
- Find where diameter and number of logs intersect in the table

- Example:
 - ◆ 2 logs at
12 inch DBH=
92 board ft.

DIAMETER OF TREE (INCHES)	4	5	6	7	8	9	10	11	12	13
1 16 FOOT LOG	36	46	56	66	76	86	96	106	116	126
2 16 FOOT LOGS	59	76	92	109	126	143	160	177	194	211
3 16 FOOT LOGS	73	96	120	143	166	189	212	235	258	281
4 16 FOOT LOGS			137	171	205	239	273	307	341	375
5 16 FOOT LOGS				164	208	252	296	340	384	428



How to Measure DBH with a D-Tape

- The video below shows how to measure a tree using a Diameter Tape (D-Tape)
- [Measuring tree diameter using a diameter tape - YouTube](#)



Measuring Tree Height with a Clinometer

- The video below is a great presentation on using a clinometer.
- [Measuring tree height with a clinometer - YouTube](#)



Increment Borer

- Used to determine single tree or stand age.
- You can also find out how growing seasons in past years were by looking at the rings.
- [Determining the age of a tree with an increment borer - YouTube](#)



Go give it a try!

- If you have questions reach out to me:
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